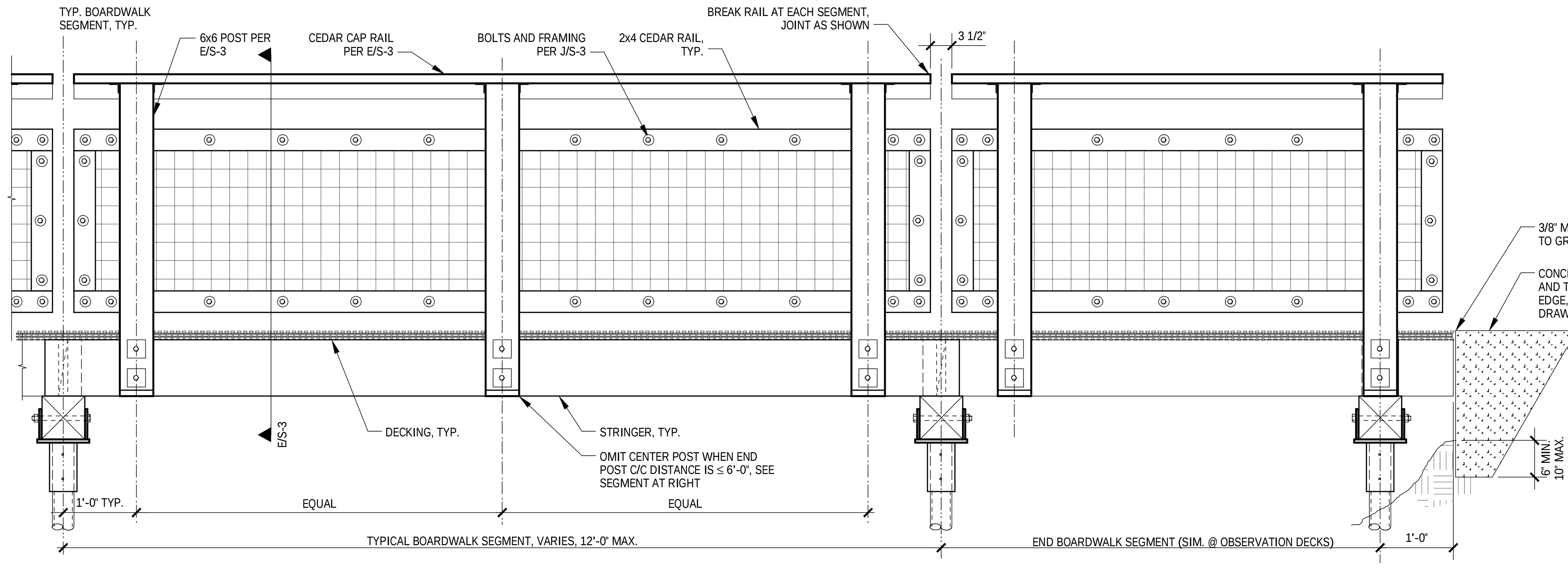
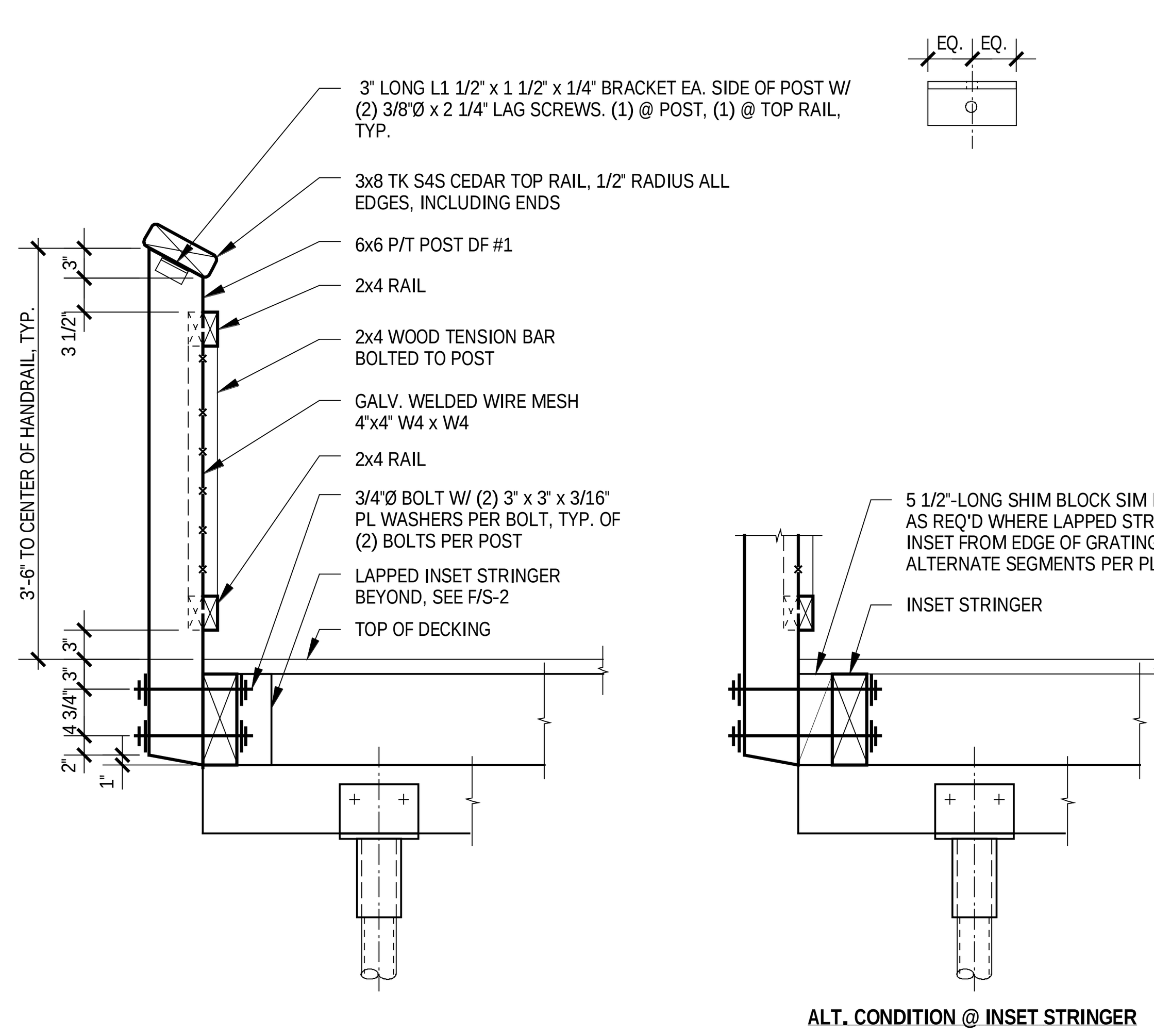


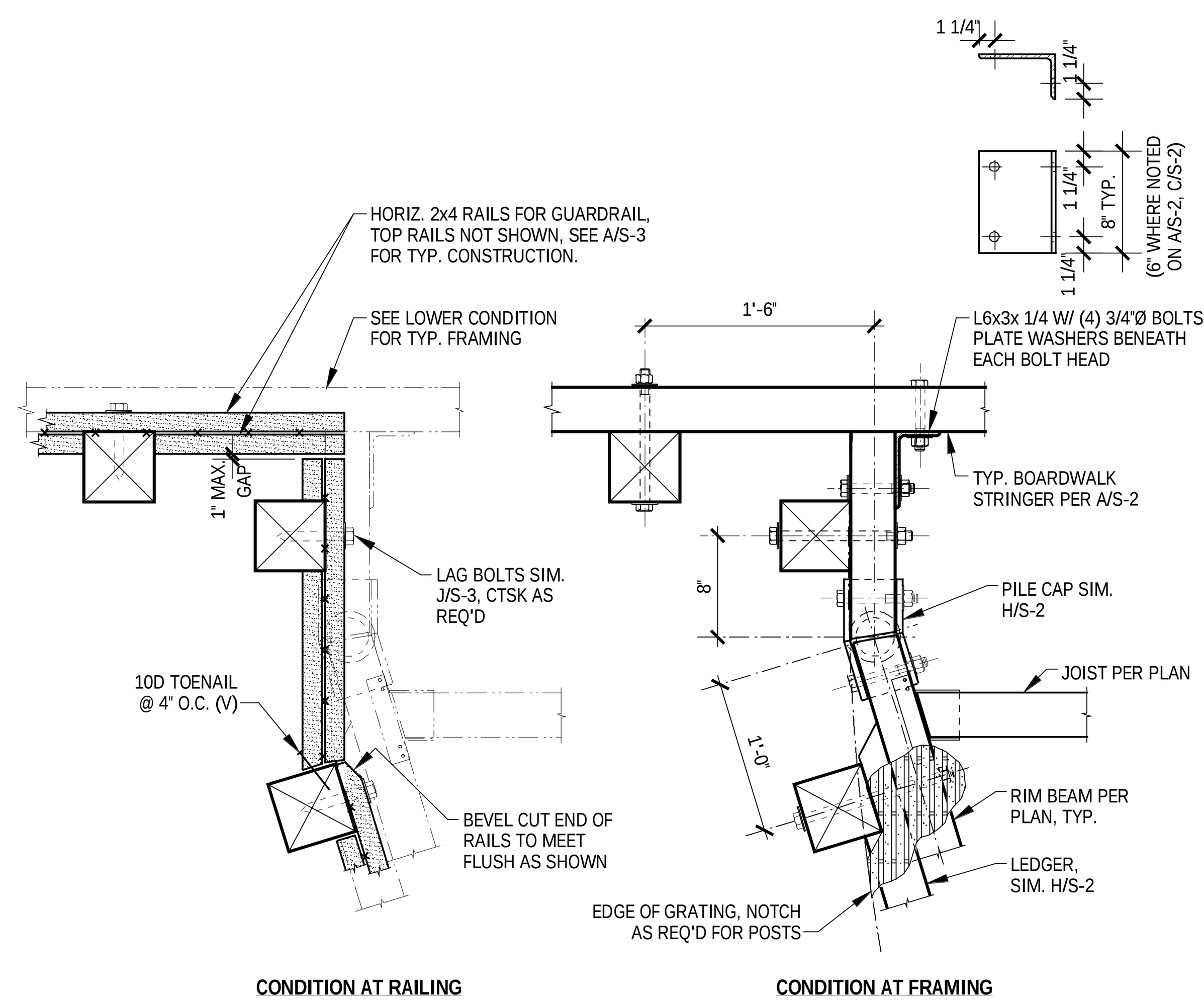
A / S-3 **Typical Guardrail Exterior Elevation**

Scale: 3/4" = 1'-0"



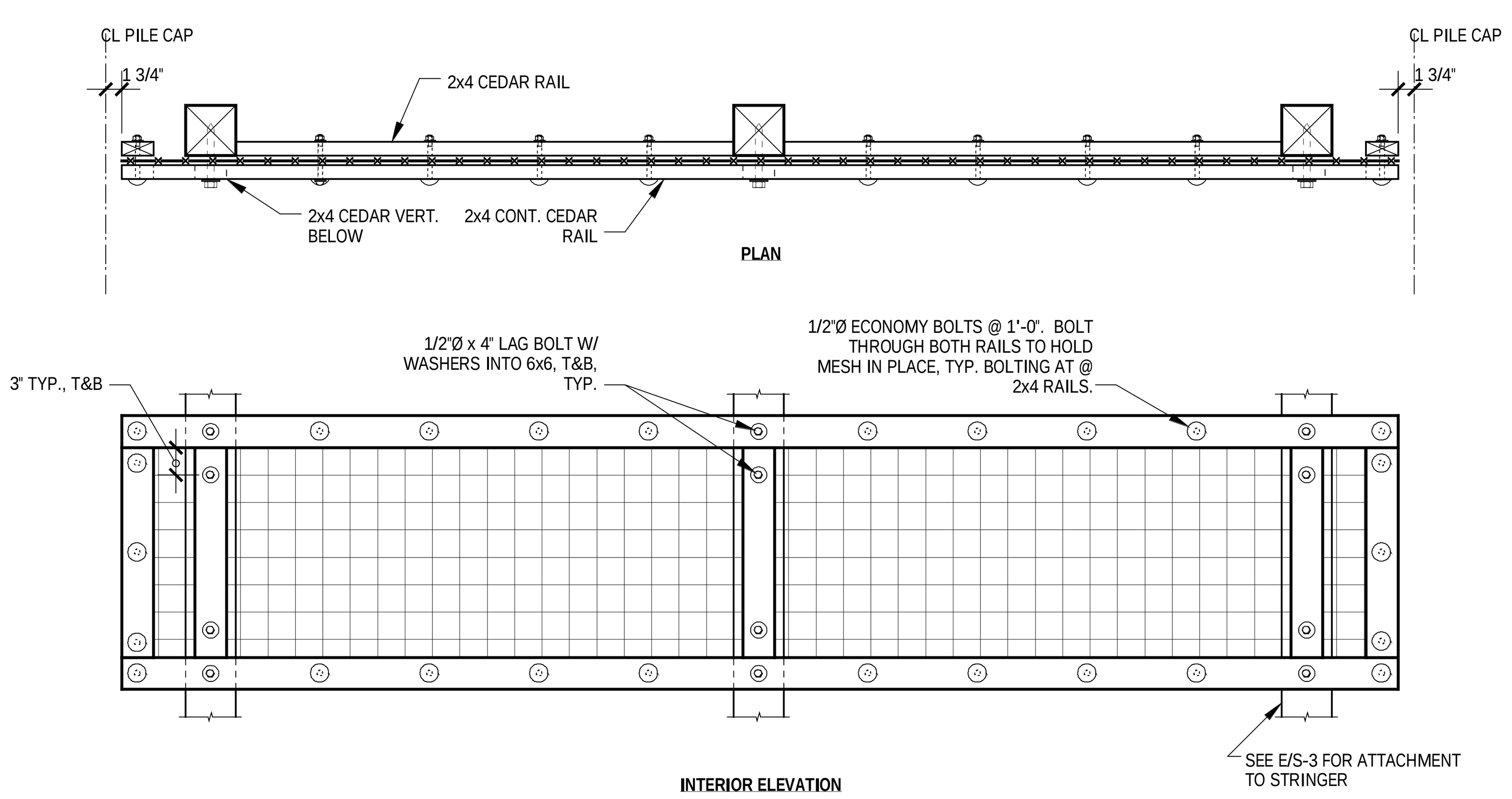
E / S-3 **Typical Guardrail Section**

Scale: 3/4" = 1'-0"



F / S-3 **Partial Plan at Observation Deck Corner**

Scale: 1" = 1'-0"



J / S-3 **Typical Guardrail Bolting And Framing**

Scale: 3/4" = 1'-0"

STRUCTURAL NOTES

BUILDING CODE CRITERIA

1 All constructionis to be in accordancewith the minimum provisions of the 1997 Uniform Building Code (UBC). Where these plans and specificationsdo not state specificallyotherwise the provisions of the UBC shallapply.

2 Structuralsystem:

Timber-framed boardwalk supported on steel pipe mini-piles, with gritted fiberglass decking.

3 VerticalLive Loads:

Uniform Live Load	100	PSF
Sm. Vehicle Axle Load	3000	LBS (non-concurrentwith uniformlive load)

4 Dead Loads: Vertical

Boardwalk	20	PSF (Includingframing)

5 LateralLoads:

Seismic Loading		Wind Loading	
Seismic Zone	3	Basic Wind Speed	80 MPH
Soil Profile	SE	Exposure	C
Importance Factor	1.0	Importance Factor	1.0
R	2.2		

6 Special Inspections:

The following special inspections are required, and will be performed by the owner's testing agency. In addition, special inspection is required where noted on the drawings. Provide necessary cooperation and access for the inspector. Provide adequate noticefor inspectionbefore covering work.

A. FoundationElements:

1. Pile Installation.Installationof all piles will be observed by the Owner's testing agency and/or Engineer. Inspection and monitoring will include: Adequacy of pile hammer, cushion, and cap block prior to the start of driving; Pile handlingbefore driving, with respect to coupling of pile sections and installationof pile end caps; Pile Installation;Condition of piles during driving; and Movement of adjacentsoil and/or piles during driving. Based on the results of these obs ervations, the Engineer may recommend to the Owner that pile tip elevations be modified, either by shortening or lengthening.

2. Pile Testing Program. Piles shall undergo field testing to verify that the design loads canbe carriedwith an adequate factorof safety for the service life of the structure,and to verify the adequacy of the contractor'sinstallation operations. Prior to the installationof production piles on the project, the Contractorshall installtwo indicatorpiles: one near the eastern end of the boardwalk and one near the western end. Each pile shall be loaded incrementallyto 2 times the anticipatedworking load or to the point of failure, whicheveris achieved first. Verticaldisplacements will be recorded by the Owner's testing agency or Engineer for each load interval. The Engineer may recommend to the Owner that additional indicatorpiles be installed. The contractorshall submit a pile testing plan as part of their Construction Plan and Schedule. This plan shall outline the methods the contractorwill employ to verify that installed piles can provide verticalcapacities 2 times the anticipated working loads. This document shall be reviewed and approved by the project engineer prior to field implementation.

7 StructuralObservation:

The StructuralEngineer of record will perform StructuralObservations per UBC Section 1702, as required.

01000 GENERAL

1 Employ good standards of workmanship throughout. Provide all materials and perform allconstructionas indicated. Secure architect'sapproval for substitutions.

2 See specificationsfor detailed materialand methods. In case of conflictbetween applicable codes, the specifications, these notes, and the drawings, the most stringentwill govern.

3 Verify alldimensions in the field and with the engineer, and upon discovery of any discrepancybetween the structuraldrawings and field conditionsor other drawings, notify the engineer.

4 Use these drawings in conjunctionwith the civil and other disciplines' drawings. They are not to stand alone. These drawings and the designs herein are copyrighted by Geiger Engineers, and are for use on this project only. They may not be copied or used for any other project or purpose other than as originally intended withoutwrittenapproval from Geiger Engineers.

5 Do not scaledrawings.

6 Use typical details and scheduleswherever applicable. Specific notes and details shallgovern over typical details, but any parts of typical details not so altered will stillapply.

7 The structureas shown on these drawings is designed to be stable and to resist the indicated loads in the completed condition. The drawings do not indicate the method or sequence of construction,except as may be specifically noted. The contractoris solely responsible for design and supply of all erection bracing and shoring to resist verticaland lateralloads, and for safety programs, methods, and procedures of operation for the constructionof the design shown on these drawings.

8 Determine that loading applied to the structureduring constructiondoes not exceed the safe load-carryingcapacity of the structuralsystem or its members. The loads used in design of the members are listed in above in "Building Code Criteria."

05120 STRUCTURAL STEEL

1 Fabricate, erect, design, and detail all structuralsteel in accordance with AISC Standard Practice,except as noted.

2 Materials(except as noted in drawings):

All materialsshallbe new stock, unless noted otherwise.

Plates and bars:	ASTM A36 (A529, A572, A588 optional)	
Steel Pipe:	ASTM A53, Grade B	
Other Shapes:	ASTM A36	
Bolts:	ASTM A307	
Threaded Rods	ASTM A36 Weld electrode: AWS D1.1–98, Table3.1, E70xx Low hydrogen	
Galvanizing:	Shapes and weldments	ASTM A123
	Bolts and hardware	ASTM A153

3 Minimum welds:

Welds not specified shall be 3/16" continuousfillet welds, or minimum size per AISC, whicheveris greater.

All weld sizes are effective sizes; increase as required if gaps exist at meeting surfaces.

Groove welds not otherwise noted shallbe complete penetration.

4 Welding shall be by WABO Certified welders and shall be as detailed or as specified by AmericanWelding Society Standards D1.1-90.

5 Field welding is not permitted, except as specificallydetailed

6 Bolt holes shall not be more than 1/16th" over-sized, and shall be drilled or punched; if punched, without distortion of the piece. Do not burn holes at any place.

7 All steel shapes, weldments, bolts, or other hardwareshallbe hot-dip galvanized in accordancewith ASTM standardslisted above. All damage to galvanizing shall be repaired by hot-stickmethod.

06100 ROUGH CARPENTRY

1 Materials (except as noted in drawings); all are kiln-dried, moisture content not to exceed 19%:

Posts:	DF#1
Joists and Beams:	PSL per Section 06195
Bullrails:	Hem/Fir #2 or better
Blocking and Bridging:	Hem/Fir ConstructionGrade
Commercial Connectors:	As manufactured by the Simpson Strong-Tie Company as called out on plans. Provide full catalog nailing and bolting. Hot-dip galvanize all connectorsand fastenersper Section 05120.
Cedar Handrails:	TK S4S
Cedar 2x4:	Western Cedar #1
FabricatedConnectors:	As detailed on plans; see Section 05120.
PressureTreatment:	Water-borne salts per AWPA LP-2, unless noted otherwise.

2 Use pressure treated materialsas follows and where indicatedon plan:

A	Solid sawn lumber:	AWPA C2
B	PSL framingmembers	Wolmanized CCA SL-2

3 General Framing-Joists

- At alljoists, provide full-depth blockingat midspan.
- Provide miscellaneousblocking where shown on drawings.
- Decking should be produced in full-length panels wherever possible. If deckingmust be spliced due to manufacturingcapabilities, notify engineer and provide additionaljoist beneath splice.
- Do not notch joists in middle one-half of span; limit depth of notch to 1/6 the depth of the joist, except as detailed. Locate bored holes within the middle 1/3 of the depth of the joist, not-to exceed 2-1/2" diameter.

4 Provide typical nailing per UBC Table 23-II-B-1 where not called out in plans. Unless noted otherwise, allnailsare common wire nails. "16d vinyl coated sinkers" may be used in lieu of 10d common nails; they may not be used to replace 16d common nails. Predrillas requiredto avoid splitting.

5 All fasteners, hardwareand fittingsshallbe hot-dip galvanized per Section 05120.

6 Lag bolts or screws shall be square-head steel bolts with cut threads. Use washersunder heads, typical. Pre-drillholes with bit approximately 60% of shank diameter; installbolts by turning,do not hammerinto place.

7 Machine bolts shallbe ASTM 307 bolts, unless otherwise noted. Use standard washersunder head, plate washers under nut.

06195 MANUFACTURED WOOD BEAMS AND JOISTS

1 All sizes shown for manufacturedwood beams and joists are actualsizes as shown on plan, unless noted otherwise. Follow the manufacturer'srecommendations for handling, cutting and sealing of all manufacturedlumber products. Cut holes for other trades only in accordancewith the manufacturer'sdirections.

2 ParallelStrand Lumber (PSL)

A PSL is lumber made of longitudinallyoriented Western Species wood strands assembled and bonded under pressure with waterproof adhesive.

B Acceptable Products:

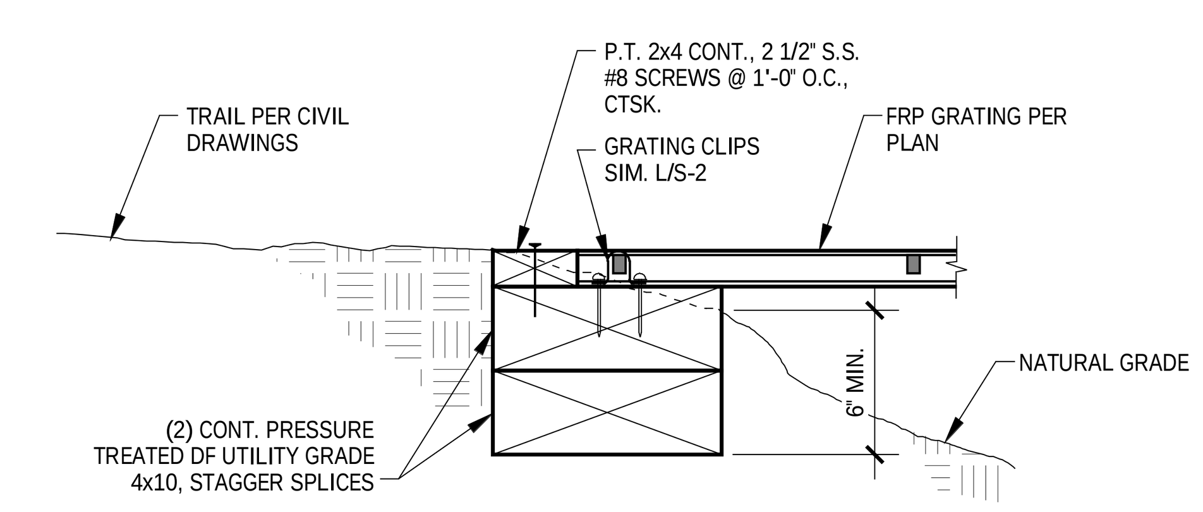
Parallam® by TrusJoistMacmillan

C Allowable Stresses (before Wolmanized CCA process):

Fb = 2900 psi

Fv = 290 psi

E = 2,000 ksi



M / S-3 **South Bank Observation Deck Grating at Trail**

Scale: 1 1/2" = 1'-0"

GEIGER ENGINEERS
114 W. Magnolia Street Suite 505
Bellingham . WA . 98225-4369
tel 360.734.7194 . fax 360.734.7399 .
e-mail : mail@geigerengineers.com

Project Name: Holly Street Landfill Cleanup / Whatcom Creek Estuary Restoration

Project Location: Bellingham, Washington

Drawing Title: Structural Notes / Guardrail Details

No.	Issue/Revisions	Date
1	DRAFT FINAL 100%	24 FEB 04
0	90% REVIEW SET	19 DEC 03

THIS DRAWING IS AN ELECTRONIC PDF FILE. IT WAS SEALED BY THE ENGINEER OF RECORD ON 24 FEB 2004. A SEALED COPY OF THIS DRAWING MAY BE FOUND AT GEIGER ENGINEERS OFFICE LOCATED AT:

114 WEST MAGNOLIA STREET
SUITE 505
BELLINGHAM, WA 98225.

Engineers Seal

Job No:	202829.00
Drawn By:	GDKinney
Checked By:	DDLinkhart

Sheet: **S-3**

Date Printed: Tuesday, February 24, 2004 3:16:55 PM

File Name: 202829.00 S3 Details / Notes